Case Studies of 5MW CHP Systems

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Case Studies:

- **Austin Energy**
- **Ft. Bragg Army Base**

Atlanta, GA
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OAK RIDGE NATIONAL LABORATORY
MANAGED BY UT-BATTELLE FOR THE DEPARTMENT OF ENERGY

0.3-5 MW Energy Systems for District Applications

Burns and McDonnell (Austin)

– 5 MW turbine generator integrated with 2,500 RT of waste-heat absorption cooling

Honeywell Laboratories (Ft. Bragg)

– 5 MW turbine generator integrated with 1,000 RT waste-heat chiller and HRSG

Gas Technology Institute Team

– Engine generator (290 kW to 770 kW) integrated with absorption chillers

http://www.eere.energy.gov/der/bchp_packaged.html

70-300kW Energy Systems for Building Applications

United Technologies/Capstone Team

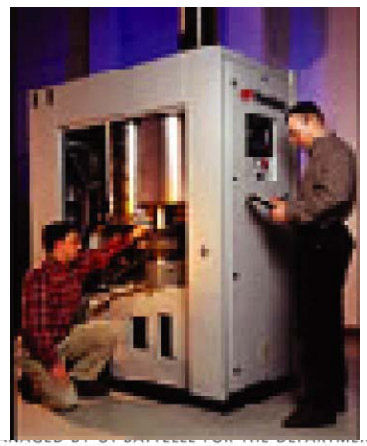
– Four 60 kW microturbines integrated with a 110 RT PureComfort waste-heat fired chiller

NiSource Team

– Three 60 kW microturbines integrated with chiller, dehumidification, hydronic heating

Ingersol-Rand Team

– 70-100 kW microturbine integrated with waste-heat fired absorption refrigeration



Systems Integrate On-site Energy and Thermally-Activated Technology

Distributed Generation Technology

Thermally-Activated Technology

950ºF

600ºF

360ºF

180ºF

Gas-turbine

Solid Oxide Fuel Cell

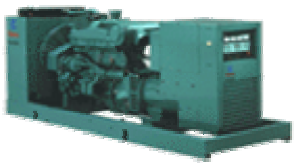
Triple-Effect Absorption

Micro-turbine

Phosphoric Acid Fuel Cell

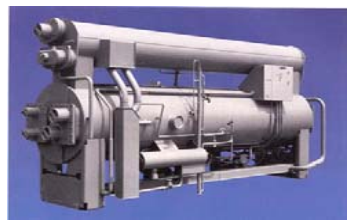
Double-Effect Absorption

Desiccant Technology



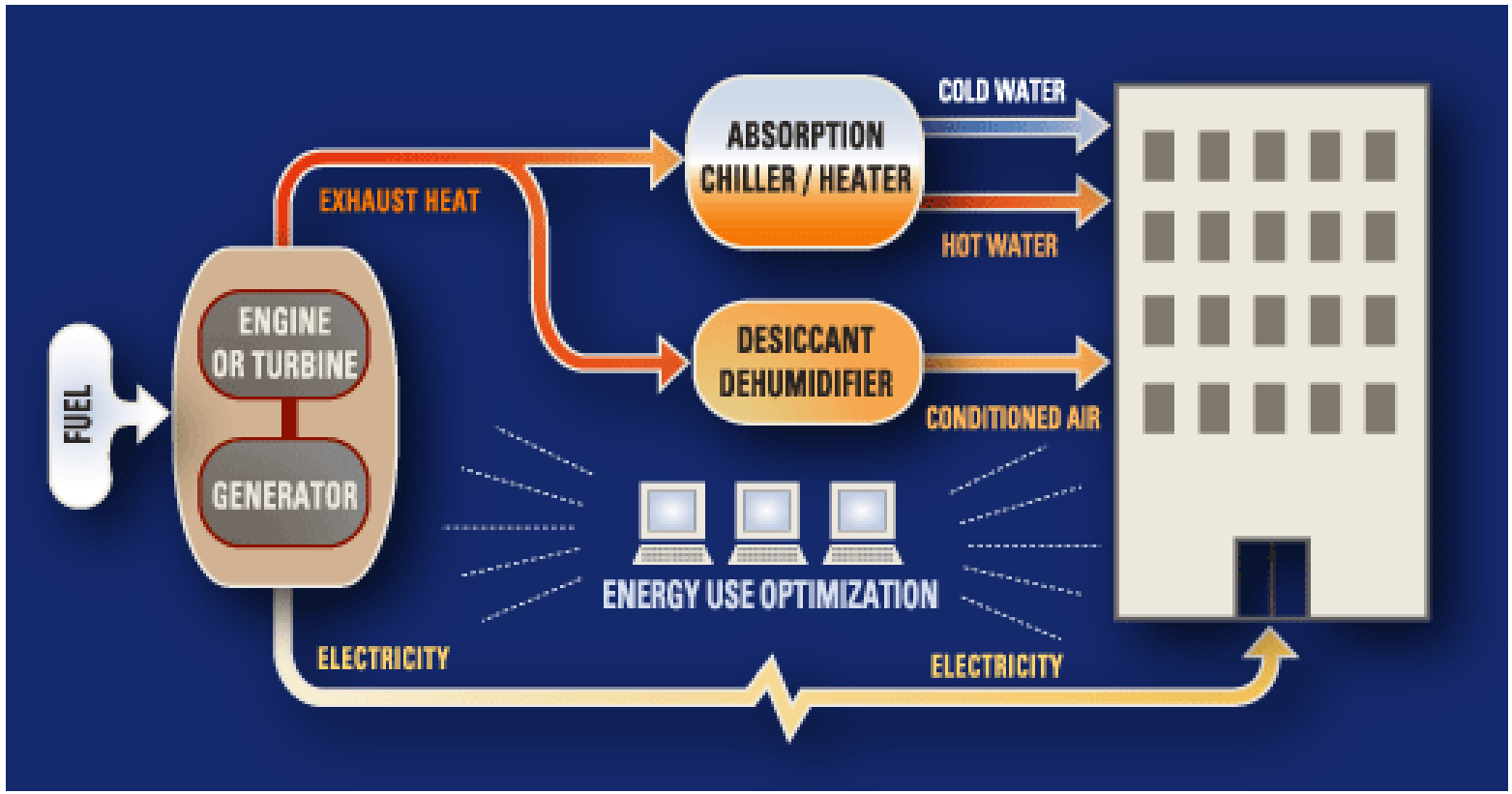
I.C. Engine

PEM Fuel Cell

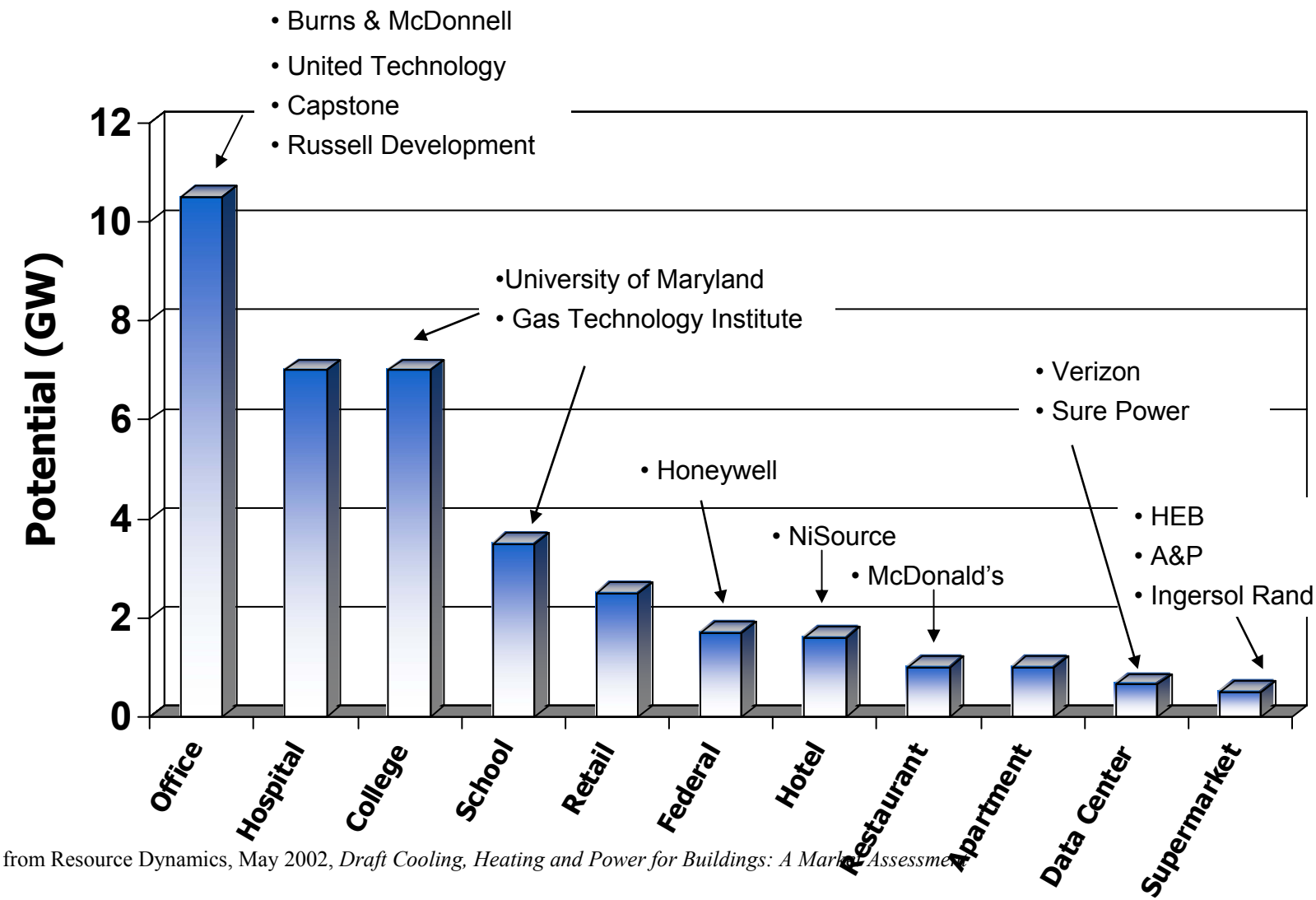


Single-Effect Absorption

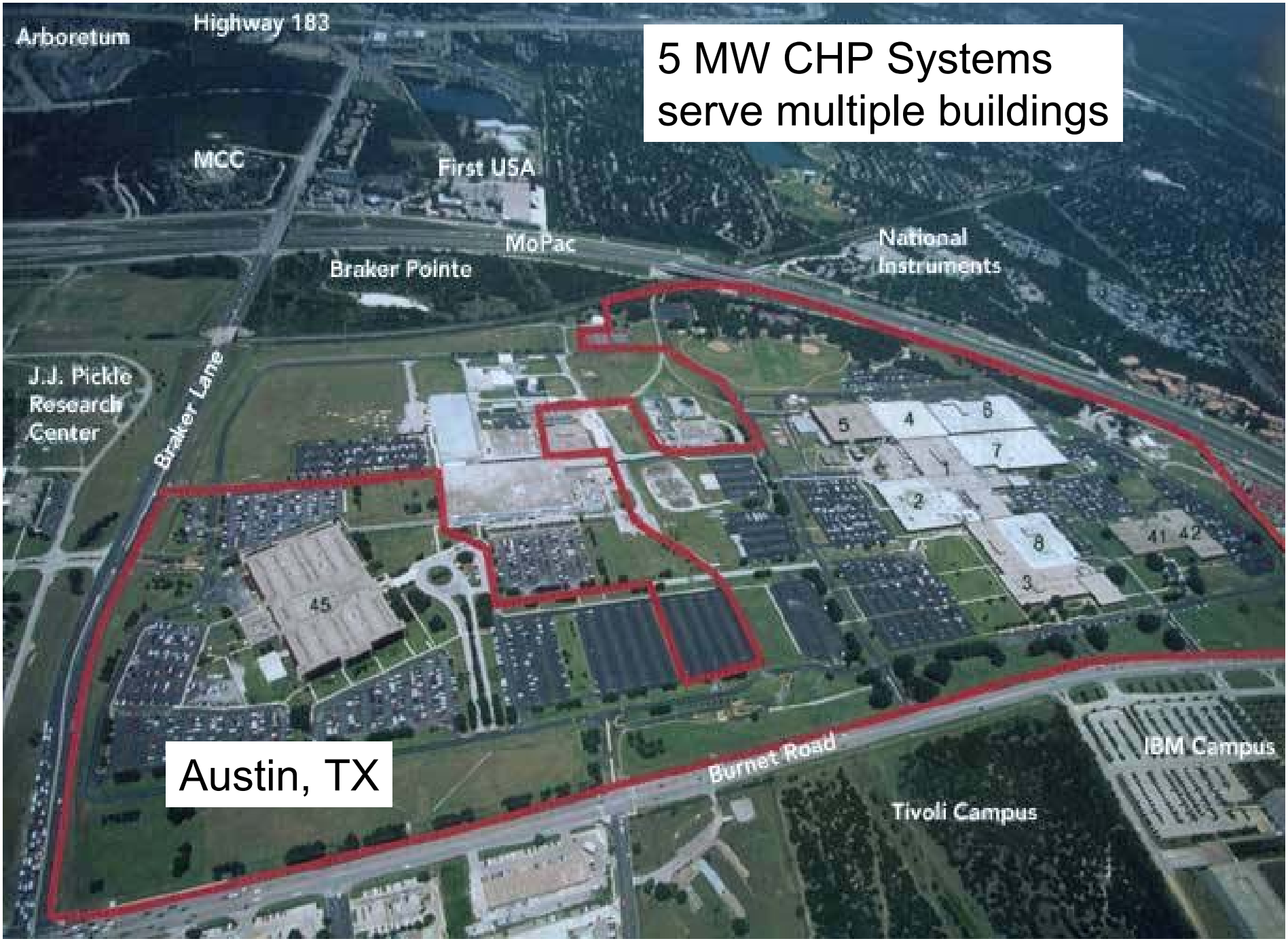
Integrated CHP System



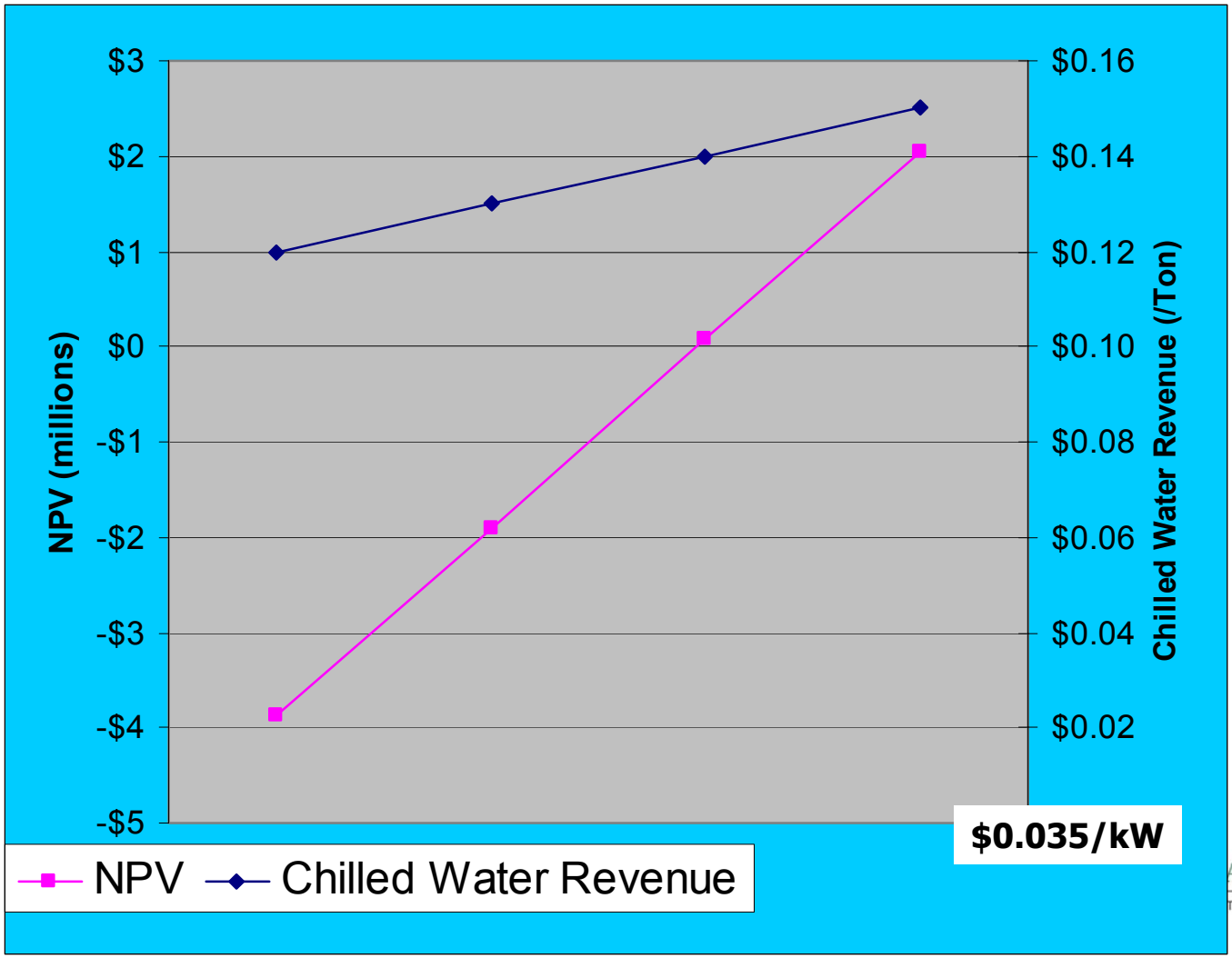
DOE/ORNL Projects target market sectors



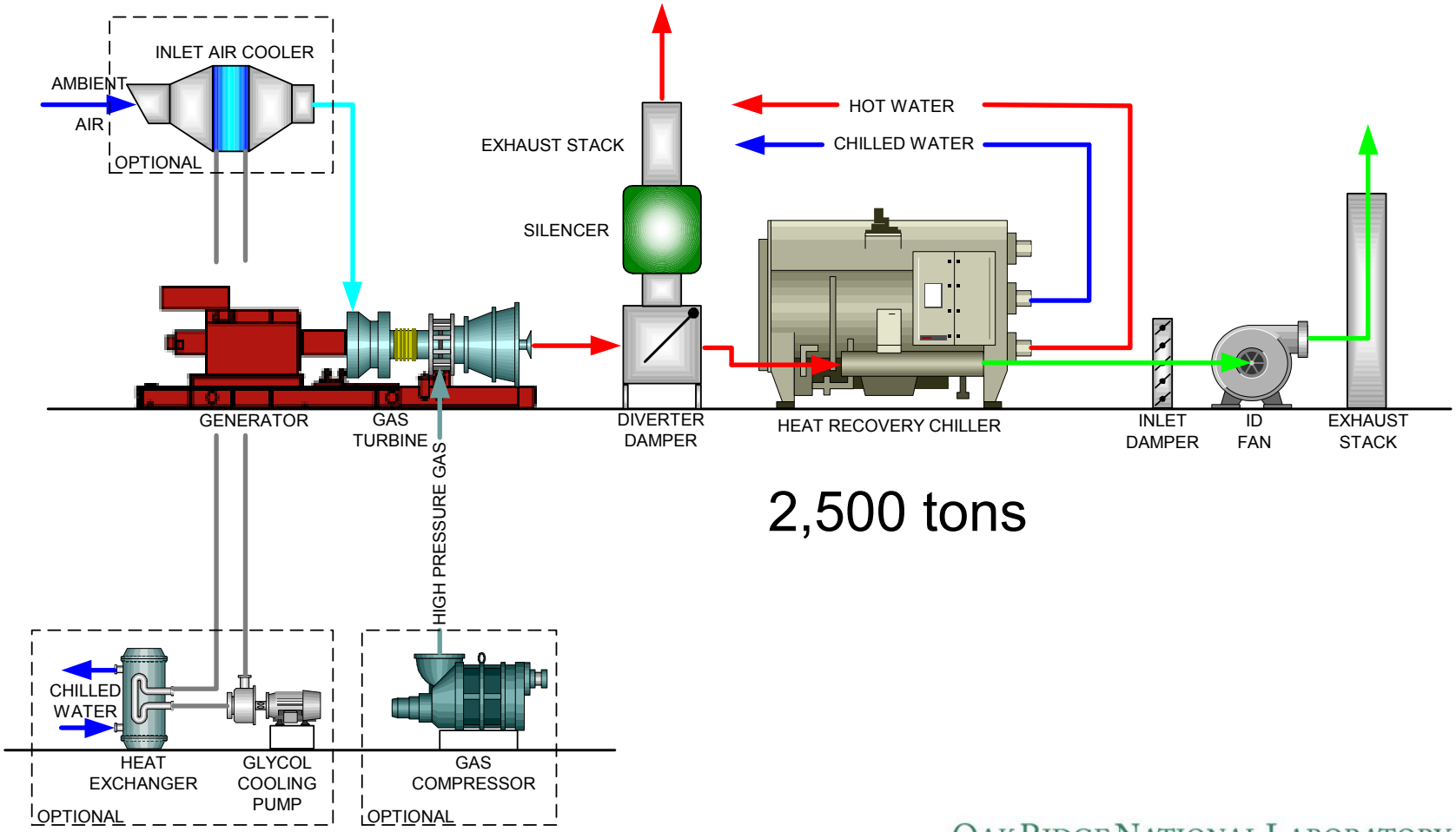
Data from Resource Dynamics, May 2002, *Draft Cooling, Heating and Power for Buildings: A Market Assessment*


Arboretum
Highway 183
MCC
First USA
MoPac
Braker Pointe
National Instruments
J.J. Pickle Research Center
Braker Lane
Burnet Road
IBM Campus
Tivoli Campus
5 MW CHP Systems serve multiple buildings
Austin, TX

Chilled water revenue drives project economics

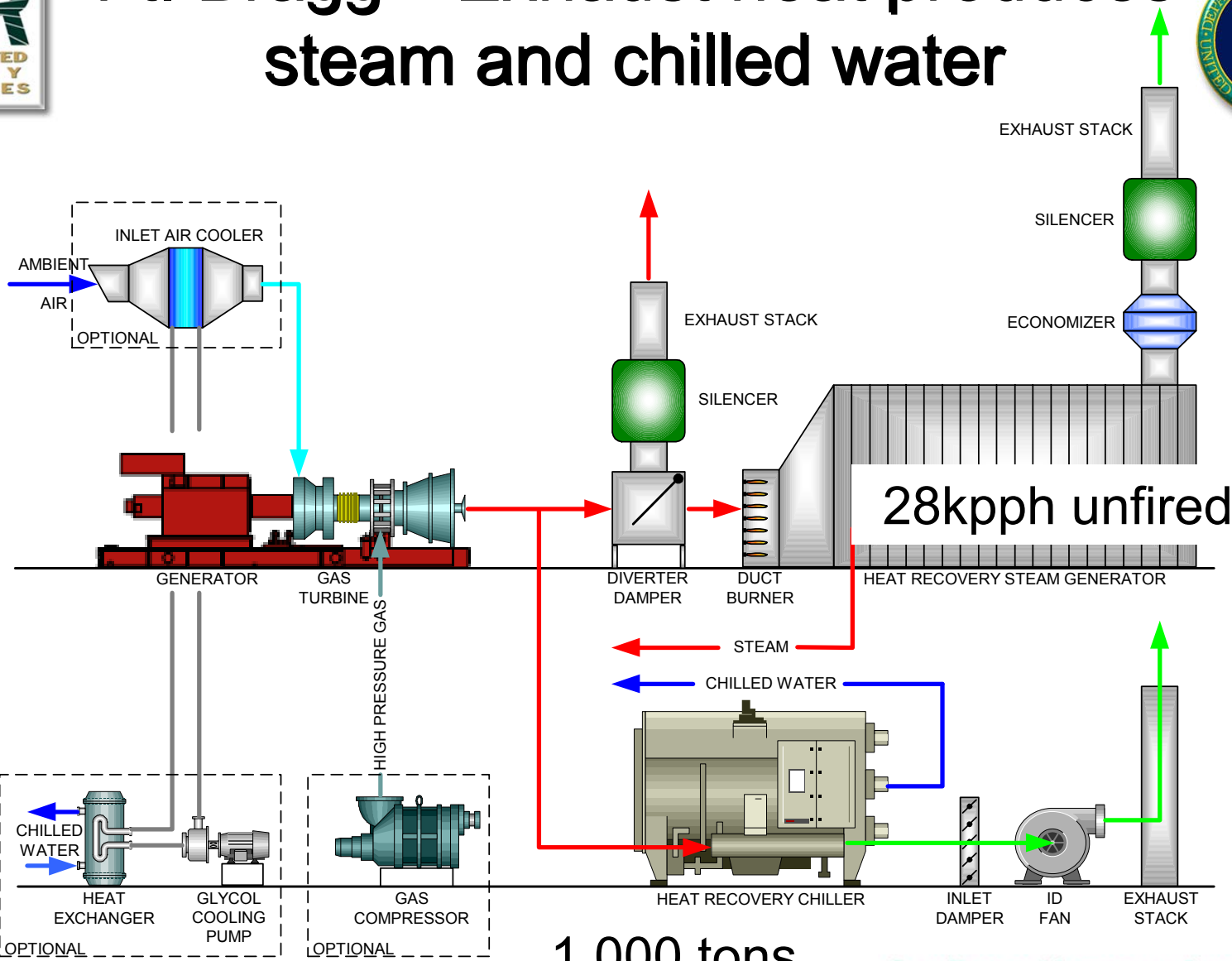


Austin—Exhaust heat produces chilled water



2,500 tons

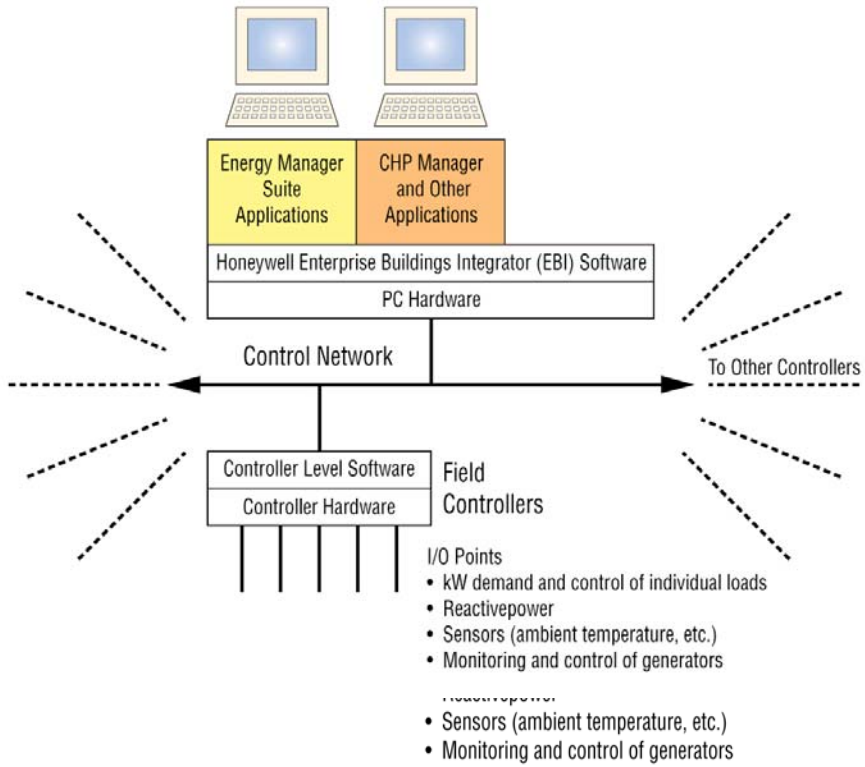
Ft. Bragg—Exhaust heat produces steam and chilled water



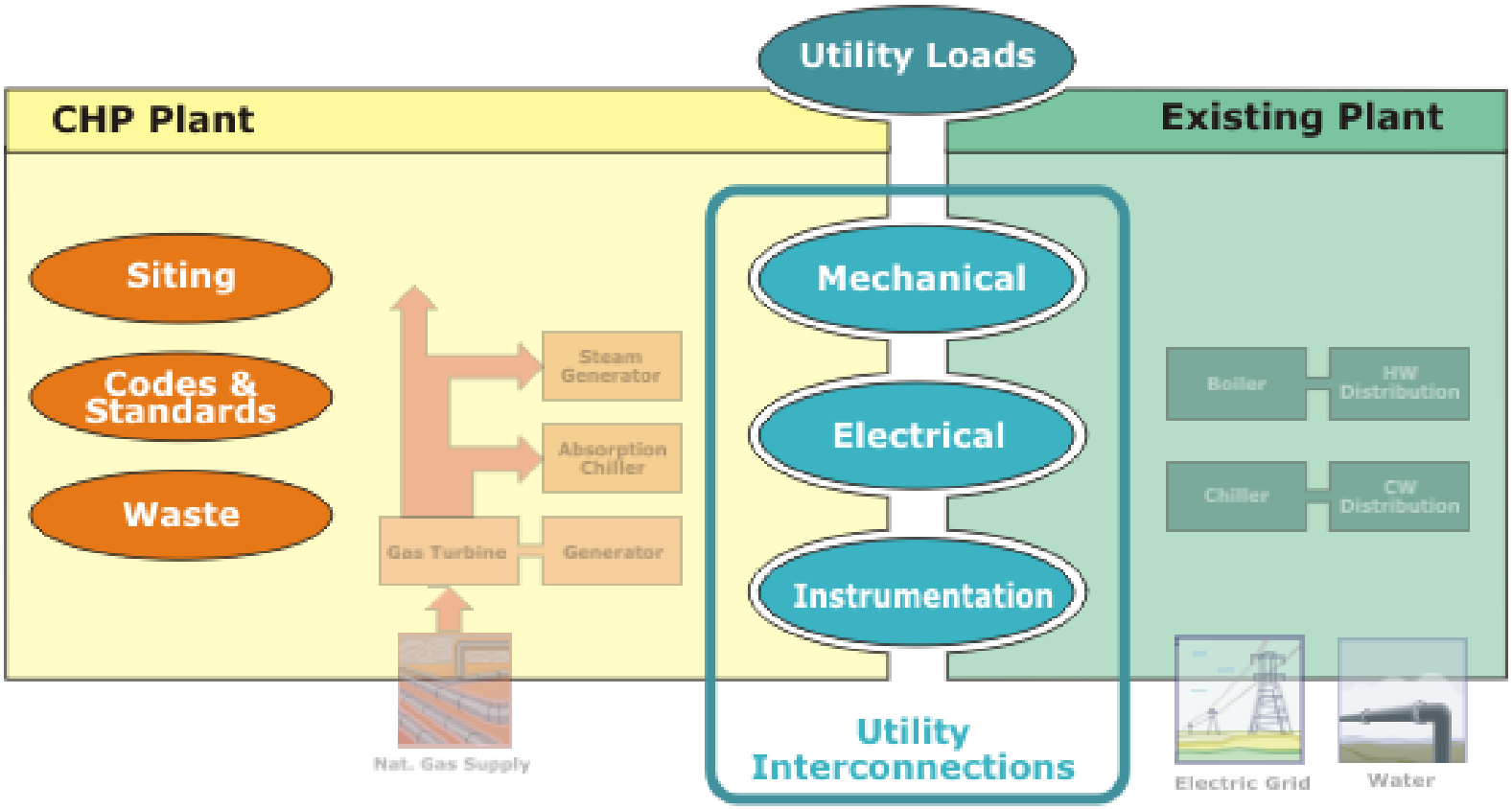
1,000 tons

Packaged CHP advance systems controls

- Optimize system performance on:
  - Cost savings,
  - Energy reliability for critical uses
  - Compliance with emissions permit,
- multiple operating scenarios



Design tips: interface requirements defined



http://www.bchp.org/prof-design-require.html

DER/CHP System installed to meet site-specific needs

- Austin Energy – Burns & McDonnell
  - Reduce energy costs
  - Reduce air emissions
- Ft. Bragg – Honeywell
  - Improve power reliability and security
  - Isolate facilities from off-site generation with on-site power, heating, and cooling
  - Increase energy choices—minimize fuel supply pricing risks